

AMENDMENT TO THE SPECIFICATION

Kindly amend the above application as follows.

a) In reference to section heading Description of Figs. 1 – Inertial Pointer, after the Summary of the Invention and before the Description of Figs. 2 – Acceleration-to-position Conversion Circuit, delete this section of the specification and replace such deleted section with the following replacement section:

Description of Figs. 1 – Inertial Pointer

A block diagram of an inertial pointer 100 is shown in Fig. 1. An acceleration sensor 2 measures acceleration of the mouse in the X, Y, or Z direction, respectively. The signal representing the acceleration in each direction can be integrated using an integrator circuit 4 to obtain the speed of motion of the pointer, and integrated again in an integrator circuit 6 to obtain the position of the pointer. The position coordinates can be transmitted directly to the computer using a wired or wireless link 10. The position coordinates can be transmitted to the computer as analog signals or converted to digital format using an analog-to-digital (ADC). An adder 12 and a control logic 14 can be used to process the position coordinates further, depending on the resolution and sensitivity desired for the pointer. Alternatively, either the acceleration or velocity information can be transmitted directly to the computer, and the processing of such quantities can be accomplished by means of circuitry or software located in the computer to determine the position coordinates for the inertial pointer in the electronic display.

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In reference to section heading Description of Figs. 2 – Acceleration-to-position Conversion Circuit, after the Description of Figs. 1 – Inertial Pointer and before the Conclusion, delete this section of the specification and replace such deleted section with the following replacement section:

Description of Figs. 2 – Acceleration-to-position Conversion Circuit

A block diagram of a circuit to convert linear acceleration to position coordinates for each axis is shown in Fig. 2. An acceleration sensor 20 detects inertial motion (acceleration) and provides an acceleration signal 22. Acceleration signal 22 is integrated by integrator circuit 24 to generate a velocity signal 38. Velocity signal 38 is further integrated by integrator circuit 26, which includes a discharge switch 28 in parallel with an integrating capacitor 44. Control logic circuitry 32 ~~uses a clock 40 to time the switching of discharge switch 28 at a frequency of typically 100Hz, depending on the resolution and sensitivity desired for the pointer.~~ Control logic circuitry 32 first enables a START control on ADC 30 to convert the output 42 of integrator 26 to a digital representation. In addition, control logic 32, and then enables discharge switch 3228 so that capacitor 44 is discharged. Control logic circuitry 32 uses a clock 40 to time the switching of discharge switch 28 at a frequency of typically 100Hz, depending on the resolution and sensitivity desired for the pointer. The digital output 46 of ADC 30 is stored into an memory adder 34. The adder ~~in memory 34~~ combines subsequent values of ADC output 46, after capacitor 44 has been discharged, to generate a digital representation of the position coordinate for a particular axis of the inertial mouse. The

output of the adder can be transmitted to the computer using a wired or wireless link 10. Of course, the values of acceleration could be digitized by an ADC immediately from the acceleration sensor, and the integration could be performed in a digital signal processor.

An optional disable button 50 operated externally by the user can temporarily hold switch 28 enabled (shorted) to allow the mouse to be moved in space without a corresponding detection of motion. This option may be useful if the user wishes to move the mouse from one position to another, without moving the electronic pointer on the computer screen.

If the inertial pointer is used as a computer mouse, only X and Y coordinates on a horizontal plane are required. If the inertial pointer is used as a presentation tool or in a TV remote control, then only the X and Z coordinates on a vertical plane would be required. Of course, a more complex inertial pointer could be implemented with all three coordinates X, Y, and Z, where the third coordinate would provide three-dimensional effects. Lastly, if the inertial pointer is used in a mobile system such as a laptop, a reference accelerometer could be used in the mobile system in each reference direction to detect inertial motion of the entire system. Such information can then be used to correct the inertial information detected by the pointer and obtain only the relative motion of the pointer with respect to the laptop.

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